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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/842,048	04/26/2001	Yao-Hong Tsai	06720.0066	6515

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EXAMINER

LAROSE, COLIN M

ART UNIT PAPER NUMBER

2623

DATE MAILED: 05/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/842,048

Applicant(s)

TSAI ET AL

Examiner

Colin M. LaRose

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-6,8,11-13,15,18-20,22,24-26,28,29,34,35 and 37-43 is/are pending in the application.
- 4a) Of the above claim(s) 41-43 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,4-6,8,11-13,15,18-20,22,24-26 and 37-40 is/are allowed.
- 6) ☒ Claim(s) 28,29,34 and 35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I (claims 1, 4-6, 8, 11-13, 15, 18-20, 22, 24-26, 28, 29, 34, 35, and 37-40 in the reply filed on 23 February 2005 is acknowledged.

Response to Amendments and Arguments

2. Applicant's arguments (see Remarks, pp. 15-17) regarding newly amended independent claims 1, 8, 15, and 22 are persuasive.

Regarding claims 1, 8, 15, and 22, the previous combination of Poggio and Lai (see Final Rejection dated 21 October 2004, paragraph 7) taught an illuminant compensation system wherein a face region is illuminant-corrected using a surface fitting based only on the face region – that is, Poggio teaches masking out pixels outside of the face region (403, figure 4) and then performing illuminant correction on only the face region (404, figure 4); Lai was relied upon for the details of correcting the illumination via a surface fitting technique.

The combination of Poggio and Lai does not fairly teach or suggest “the surface fitting is determined using only the skin color pixels of the face region,” as claimed (emphasis added). The aforementioned combination of Poggio and Lai teaches performing illuminant correction using a surface fitting based only on pixels of a face region, however, it does not teach that the surface fitting is based only on the skin-colored pixels within the face region. Rather, Poggio teaches utilizing the entire masked face region with no consideration to the colors of the pixels within the face region.

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For these reasons, claims 1, 8, 15, and 22, and all claims dependent therefrom are allowed.

3. Applicant's arguments (see Remarks, pp. 17-19) regarding independent claims 24-26 are persuasive.

Regarding claims 24-26, the previous combination of Poggio, Lai, and Qian (see Final Rejection dated 21 October 2004, paragraph 8) suffers from the same deficiencies as above for claims 1, 8, 15, and 22. Namely, Qian was relied upon to show that it was conventional in the art to determine a face region to consist of only those pixels that are skin-colored. However, Qian does not appear to provide the necessary teaching or motivation to modify Poggio and Lai to determine a surface fitting using only pixels within a predetermined set of colors, such as skin-colored pixels. Therefore, as in claims 1, 8, 15, and 22, the combination of Poggio, Lai, and Qian does not appear to fairly disclose or suggest determining a surface fitting using only pixels within a face region that are within a predetermined set of colors.

For these reasons, claims 24-26, and all claims dependent therefrom are allowed.

4. Applicant's arguments (see Remarks, pp. 19-21) regarding claims 28 and 34 are not persuasive. Claims 28 and 34 merely require that the pixels for which the normalization is effected be "part of a face image." There is no other constraint as to which pixels are to be utilized, such as the claims discussed above, wherein only the skin-colored pixels were used to determine the surface fitting. Poggio teaches normalizing pixels within a face region using

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histogram equalization, and Zettel provides the details of histogram equalization, which transforms the gray level of pixels using a mean and a standard deviation.

5. Claims 29 and 35 merely require that determining whether a pixel is in the face region includes determining whether the pixel is skin-colored. Such a method for determining a face region is fairly taught by Qian. These claims would be allowable if rewritten to be more in accordance with claims 1, 8, 15, 22, and 24-26, which require that the face region consist only of skin-colored pixels or pixels within a predetermined set of colors.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 28 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,642,431 by Poggio et al. ("Poggio") in view of U.S. Patent 4,975,970 by Zettel et al. ("Zettel").

Regarding claims 28 and 34, Poggio discloses a method/program for processing facial images. In particular, Poggio discloses normalizing a facial region in an image, wherein pixels of the image are determined to be either in the face region or not in the face region (see e.g. step 403, figure 4, wherein Poggio masks out certain pixels within a 19x19 window, thereby determining which pixels constitute a facial region).

Poggio teaches normalizing the facial region of the image by histogram equalization methods (405, figure 4), but is silent to the claimed first computing step, the claimed second computing step, and the claimed transforming step for normalizing the face region.

Zettel discloses a process (figure 4) for histogram equalization of an image, wherein an image is automatically normalized according to a user's preferences. In particular, Zettel discloses

computing the average gray level and standard deviation for a plurality of pixels in the image (31, figure 4), and

transforming the level of each pixel based on a scale factor derived from the mean and standard deviation (35, figure 4), wherein the gray levels are within a predetermined range (figure 3: $V_{\min} \dots V_{\max}$ is the predetermined range of possible pixel values).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Poggio by Zettel to achieve the claimed invention since Poggio discloses normalization of the face image via histogram equalization, and Zettel teaches that performing histogram equalization as claimed allows a user to specify a preference for image brightness and contrast in order to produce a visually preferred image (column 3, lines 54-60).

7. Claims 29, 32, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poggio in view of Zettel, and further in view of U.S. Patent 6,148,092 by Qian.

Regarding claims 29 and 35, Poggio is silent the determining of whether a pixel is part of the face region including the determination of whether the pixel is skin-colored or within a predetermined set of colors, as claimed.

Qian discloses a method for extracting a face region that comprises detecting skin tones and segmenting a face from background regions based on the detected skin tones. In particular, Qian teaches detecting a face in an image comprised of a plurality of colors pixels by:

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determining for each pixel whether the pixel's color is within a predetermined set of colors (i.e. whether each pixel is within the circle in figure 3); and

determining the pixel to be part of the face region if it is determined that the pixel's color is within the predetermined set of colors (i.e. the pixels that are within the circle are assigned a "1" and all other pixels are assigned "0", as shown in figure 5). See also column 4, lines 41-60.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Poggio by Qian to determine for each pixel whether the pixel's color is within a predetermined set of colors and determining the pixel to be part of the face region if it is determined that the pixel's color is within the predetermined set of colors by extracting the face region according to skin tone, since Qian teaches that detecting face regions in this manner is advantageous because, *inter alia*, it is insensitive to changes in lighting conditions (column 2, lines 30-35).

Allowable Subject Matter

8. The following is an examiner's statement of reasons for allowance:

Independent claims 1, 8, 15, 22, and 24-26, and all claims dependent therefrom are allowed for the reasons set forth above in paragraphs 2 and 3.

9. Claims 29 and 35 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and to include language conforming to the suggestions proposed above in paragraph 5.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

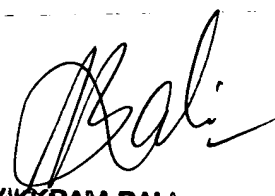
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (571) 272-7414. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CML
Group Art Unit 2623
30 April 2005


VIKRAM BALI
PRIMARY EXAMINER